WHAT IS CLAIMED IS:

1. A composition of functional additives useful for incorporating in water as a dip for the preservation of cut apple pieces comprising ascorbic acid and calcium ions, wherein the molar ratio between the ascorbic acid and the calcium ions is between about 2.8:1 to about 4.0:1.

2. A composition according to claim 1 wherein the molar ratio is between about 2.8:1 to about 3.5:1.

3. A composition according to claim 1, wherein the composition further comprises magnesium ions, and the weight ratio between the calcium ions and magnesium ions is between about 5.4:1 and about 11.3:1.

4. A composition according to claim 3, wherein magnesium ions are derived from magnesium chloride hexahydrate or anhydrous magnesium chloride.

5. A composition according to claim 1 wherein the calcium ions are derived from one or more of the group consisting essentially of calcium chloride dihydrate, calcium hydroxide and calcium carbonate.

6. A composition according to claim 1 wherein the calcium ions are derived from calcium chloride dihydrate.

7. A composition according to claim 1 wherein the calcium ions are derived from calcium hydroxide.

8. A composition according to claim 1 wherein the calcium ions are derived from calcium carbonate.

9. A composition according to claim 1 wherein the calcium ions are derived from calcium chloride dihydrate, calcium hydroxide and calcium carbonate.

10. A composition according to claim 1 including sodium citrate or citric acid as a pH adjuster.

11. A solution of functional additives useful for the preservation of cut apple pieces comprising:

a. ascorbic acid having a concentration between about 5.0% and 9% (w/w); and

b. calcium ions having a concentration between about 0.4% and 0.68% (w/w);

c. water;

wherein the molar ratio between ascorbic acid and the calcium ions is between about 2.8:1 and 4.0:1.

12. A solution according to claim 11 wherein the molar ratio between ascorbic acid and calcium ions is between about 2.8:1 and about 3.5:1.

13. A solution according to claim 11 wherein the solution further comprises magnesium ions having a concentration between 0.06% and 0.10 % (w/w).

14. A solution according to claim 13 wherein the magnesium ions are derived from magnesium chloride hexahydrate or anhydrous magnesium chloride.

15. A solution according to claim11 wherein the calcium ions are derived from one or more of the group consisting essentially of calcium chloride dihydrate, calcium hydroxide and calcium carbonate.

16. A solution according to claim 11 wherein the calcium ions are derived from calcium chloride dihydrate.

17. A solution according to claim 11 wherein the calcium ions are derived from calcium hydroxide.

18. A solution according to claim 11 wherein the calcium ions are derived from calcium carbonate.

19. A solution according to claim 11 wherein the calcium ions are derived from calcium chloride dihydrate, calcium hydroxide and calcium carbonate.

20. A solution according to claim11 wherein the pH is adjusted with citric acid or sodium citrate.

21. A solution of functional additives useful for the preservation of cut apple pieces comprising water and about 5.6% to 9% (w/w) ascorbic acid, about 0.3% to 1% (w/w) calcium chloride dihydrate, and about 0.06% to 0.5% (w/w) calcium hydroxide dissolved in the water, the solution having a pH of 3.5 to 4.5.

22. A solution according to claim 21 further including about 0.5% to 1.0% (w/w) calcium carbonate.

23. A solution according to claim 21 including about 0.5% (w/w) magnesium chloride.

24. A solution according to claim 21, wherein the pH is adjusted with citric acid or sodium citrate.

25. A method of preserving fresh cut apples comprising:

a. washing whole fresh apples in a sanitizing solution;

b. coring and cutting the apples into pieces;

c. immersing the apple pieces in a solution made from the composition according to claim 1 for a period of time sufficient to transfer the functional additives in the composition to the apple pieces;

d. removing excess solution from the apple pieces;

e. packaging the cut apple pieces into containers; and

f. quick-chilling the treated cut apple pieces in the sealed containers at temperatures of 0 to 4°C for at least 24 hours.

26. A method of preserving fresh cut apples comprising:

a. washing whole fresh apples in a sanitizing solution;

b. coring and cutting the apples into pieces;

c. immersing the apple pieces in the solution according to claim 11 for a period of time sufficient to transfer the functional additives in the solution to the apple pieces;

d. removing excess solution from the apple pieces;

e. packaging the cut apple pieces into containers; and

f. quick-chilling the treated cut apple pieces in the sealed containers at temperatures of 0 to 4°C for at least 24 hours.

27. A method according to claim 26 wherein the apple pieces are immersed in the solution for a period of 2 to 3 minutes.

28. A method according to claim 26 wherein packaging the apple pieces into containers comprises packaging the apple pieces into plastic containers having gas permeabilities of 100 to 180 cm^3 of oxygen per 100 $inches^2$ per 24 hours at 25°C at 1 atmosphere and 400 to 1000 cm^3 of carbon dioxide per 100 $inches^2$ per 24 hours at 25°C at 1 atmosphere.

29. A method according to claim 26 wherein the apple pieces are packaged into containers with a headspace.

30. A method according to claim 29 wherein packaging the apple pieces into containers comprises providing a volume ratio between 0.2:1 and 2:1 between the headspace and the apple pieces.

31. A method according to claim 26 wherein packaging the apple pieces into containers comprises packaging the apple pieces into containers filled with air.

32. A method according to claim 26 wherein packaging the apple pieces into containers comprises packaging the apple pieces into containers flushed with gas having a mixture of 15% O^2 (vol), 5% CO^2 (vol), and 80% N^2 (vol).